ANNEX II: METHODOLOGICAL FRAMEWORK FOR THE ESTABLISHED SECTORS

Sources and timeframe

The analysis of the established Blue Economy sectors is based on the standardised data provided by the Structural Business Statistics (SBS) compiled by Eurostat. The SBS were complemented by the EU Data Collection Framework (DCF)[1] for the primary sectors (capture fisheries and aquaculture). Given the time lag in the release of SBS and DCF data, the latest available year is 2017, which is used as the reference year for the current report. The baseline year is 2009.

Identification of sectors

SBS data are based on enterprise data grouped under the declared main activity of each enterprise, according to the *statistical classification of economic activities in the European Community* (NACE Rev.2). Out of the 615 classes of activities singled out through a four-digit NACE code, 50 classes have been identified that have a principal or significant maritime component. They have been classified into sectors and subsectors (Table 1).

Table 1 Established Blue Economy sectors: classification

Sector	Sub-sector	NACE Code	Description	Maritime proportion
Marine living resources	Primary production	A 03.10	Capture fisheries (EU fishing fleet, data from DCF)	100
		A 03.20	Aquaculture sector (onshore and offshore production, data from DCF)	100
	Processing and distribution	C 10.20	Processing and preserving of fish, crustaceans and molluscs	100
		C 10.41	Manufacture of oils and fats	PRODCOM (10411200)
		C 10.85	Prepared meals and dishes	PRODCOM (10851200, 10851410)
		C 10.89	Other food product	PRODCOM (10891400)
		G 46.38	Wholesale of other food, including fish, crustaceans and molluscs	100
		G 47.23	Retail sale of fish, crustaceans and molluscs in specialised stores	100
Marine non-living resources	Oil and gas	B 06.10	Extraction of crude petroleum	MS Sources
		B 06.20	Extraction of natural gas	MS Sources
		B 09.10	Support activities for petroleum and natural gas extraction	MS Sources
	Other minerals	B 08.12	Operation of gravel and sand pits; mining of clays and Kaolin	100
		B 09.90	Support activities for other mining and quarrying	SBS (Weight of B 08.12 in B05, B07 and B08)
Port activities	Ports	H 52.22	Service activities incidental to water transportation	100
		H 52.24	Cargo handling (port services)	50% (or country specific information)
		H 52.10	Warehousing and storage	50% (or country specific information)
	Construction of water projects	F 42.91	Construction of water projects.	100
Shipbuilding and repair	Shipbuilding	C 30.11	Building of ships and floating structures	100
		C 30.12	Building of pleasure and sporting boats	100
		C 33.15	Repair and maintenance of ships and boats	100
	Marine equipment and machinery	C 13.92	Manufacture of made-up textile articles, except apparel	PRODCOM (13922250, 13922999)
		C 13.94	Manufacture of cordage, rope, twine and netting	PRODCOM (13941233, 13941235)

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[1] Council Regulation (EC) No 199/2008 of 25 February 2008 concerning the establishment of a Community framework for the collection, management and use of data in the fisheries sector and support for scientific advice regarding the Common Fisheries Policy.

		C 26.51	Manufacture of instruments and appliances for measuring, testing and navigation	PRODCOM (26511180, 26512080)
		C 28.11	Manufacture of engines and turbines, except motor vehicle, aircraft and cycle propulsion	PRODCOM (28111100, 28111200, 28111311, 28111315, 28111319, 28112200)
		C 32.30	Manufacture of sport goods	PRODCOM (32301300, 32301600)
Maritime Transport	Shipping and transport	H 50.10	Sea and coastal passenger water transport (water transport)	100
		H 50.20	Sea and coastal freight water transport (water transport)	100
		H 50.30	Inland passenger water transport	100
		H 50.40	Inland freight water transport	100
		N 77.34	Renting and leasing of water transport equipment	100
		H 52.29	Other transportation support activities	50% (or country specific information)
Coastal tourism	Accommodation	I 55.10	Hotels and similar accommodation	Share of tourist nights spent on coastal municipalities over MS total
		I 55.20	Holidays and other short-stay accommodation	
		I 55.30	Camping grounds, recreational vehicle parks and trailer parks	
		I 55.90	Other accommodation	
	Transport	G 47.30	Retail sale of automotive fuel in specialised stores	
		H 49.10	Passenger rail transport, interurban	
		H 49.30	Urban and suburban passenger land transport	
		H 50.10	Sea and coastal passenger water transport	
		H 51.10	Passenger air transport	
	Other expenditures	G 47.60	Retail sale of cultural and recreation goods in specialised stores	
		G 47.70	Retail sale of other goods in specialised stores	
		I 56.00	Food and beverage service activities	

Source: Eurostat and own elaboration.

Coastal tourism requires a specific treatment. It is not a single economic activity but rather a set of activities undertaken by a specific type of consumer (the tourist). Coastal tourism happens when a visitor takes a trip to a coastal municipality[2] and spends at least one night in the destination. It is considered to be part of this category the expenditures in accommodation, transport and other expenditures by tourists (cultural and recreation good, goods in specialised stores and food and beverage services). To calculate the contribution of coastal tourism to the Blue Economy, a specific methodology is followed combining data from SBS and tourism statistics. See further details under "Data imputations and assumptions" below.

While certain economic activities can be clearly identified as fully marine (for example, shipping and Maritime transport), for other sectors, the NACE classification includes both land and maritime activities (e.g. cargo handling, warehousing and extraction of oil and gas). In this later case, alternatives sources are used for the estimation of the maritime proportion (see below). Five activities (G 47.11, E 38.31, E 36.00, K 65.12, K 65.20, see Table 2) have been identified as having and important maritime component, but have no reliable source available to estimate the actual maritime proportion. Therefore, these activities were not included in this year's report.

Table 2 Sectors for which further information is needed before they can be taken into account

Sector	Sub-sector	NACE Code	Description
Living resources	Processing and distribution	G 47.11	Retail in non-specialised stores with food, beverages or tobacco predominating
Extraction of non-living resources	Other minerals	B 08.93	Extraction of salt
Shipbuilding, repair and dismantling	Shipbuilding	E 38.31	Dismantling of wrecks
Water treatment	Desalinisation	E 36.00	Water collection, treatment and supply
Insurance	Insurance	K 65.12	Non life insurance
		K 65.20	Reinsurance

Source: Eurostat and own elaboration.

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[2] Coastal municipalities are those with a coastline or with 50 % of its territory within 10 km of the sea. Certain major cities are treated differently, e.g. Rome and Amsterdam.

Aside from their main activity, enterprises may have one or more secondary activities. Unfortunately, detailed information is unavailable about the economic importance of secondary activities. Therefore, the overall activity for each frim was assigned to its main activity.

Details on the calculation of the maritime proportion

For the specific calculation of the maritime proportion, the use of alternative national sources or some general assumptions were made in the following sectors: extraction of oil and gas and supporting activities[3], cargo handling, warehousing and storage, and other transportation support activities.

For Marine equipment and machinery, PRODCOM data were used to estimate the maritime proportion in the following way: within the NACE class, products corresponding to it were identified and their production value share calculated over the total production of the class. A similar approached was followed for Prepared and other food products. The list of PRODCOM items identified as maritime for the calculation of the maritime proportions is detailed in Table 3.

Table 3 PRODCOM items considered maritime within each NACE class

NACE Class	NACE Description	PRODCOM Code	PRODCOM Description
C 10.41	Manufacture of oils and fats		
		10.41.12.00	Fats and oils and their fractions of fish or marine mammals
C 10.85	Prepared meals and dishes		
		10.85.12.00	Prepared meals and dishes based on fish, crustaceans and molluscs
		10.85.14.10	Cooked or uncooked pasta stuffed with meat, fish, cheese or other substances in any proportion
C 10.89	Other food product		
		10.89.14.00	Extracts and juices of meat, fish, crustaceans, molluscs or other aquatic invertebrates
C 13.92	Manufacture of made-up textile articles, except apparel		
		13.92.22.50	Sails
		13.92.29.99	Life-jackets
C 13.94	Manufacture of cordage, rope, twine and netting		
		13.94.12.33	Made-up fishing nets from twine, cordage or rope of man-made fibres
		13.94.12.35	Made-up fishing nets from yarn of man-made fibres
C 26.51	Manufacture of instruments and appliances for measuring, testing and navigation		
		26.51.11.80	Manufacture of instruments and appliances for navigation (including for marine or river navigation)
		26.51.20.80	Radio remote control apparatus (including for ships)
C 28.11	Manufacture of engines and turbines, except motor vehicle, aircraft and cycle propulsion		
		28.11.11.00	Outboard motors for marine propulsion
		28.11.12.00	Spark ignition reciprocating or rotary internal combustion piston engines for marine propulsion (excluding outboard motors) and for other use (excluding aircraft engines and engines for vehicles of CN chapter 87)
		28.11.13.11	Marine propulsion compression-ignition internal combustion piston engines (diesel or semi-diesel) of a power <= 200 kW
		28.11.13.15	Marine propulsion compression-ignition internal combustion piston engines (diesel or semi-diesel) of a power > 200 kW but <= 1 000 kW
		28.11.13.19	Marine propulsion compression-ignition internal combustion piston engines (diesel or semi-diesel) of a power > 1 000 kW
		28.11.22.00	Hydraulic turbines and water wheels
C 32.30	Manufacture of sport goods		
		32.30.13.00	Water-skis, surfboards, sailboards and other water-sport equipment
		32.30.16.00	Fishing rods, other line fishing tackle; articles for hunting or fishing n.e.c.

Source: Eurostat and own elaboration.

For coastal tourism the maritime proportion was calculated as the share of tourist nights spent in coastal municipalities compared to the total tourist nights in each Member State (see "Data imputation and assumptions for further details").

Indicators and variables

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[3] Data were obtained from the European Union Offshore Oil and Gas Authorities Group (EUOAG).

SBS statistics provide a series of variables usually derived from the financial statements of the companies. For the analysis of the established sectors, we have used the following selection of variables and indicators: employment (number of persons employed), wages and salaries, turnover, gross value added, gross operating surplus (profit or loss) and gross investments and net investments. In addition, we calculated the following derived indicators: average annual wage per persons employed, GVA to turnover, profit margin (gross operating surplus to turnover), labour productivity (GVA per person employed) and net investment ratio (net investment to GVA). More details about the indicators and variables are explained in the glossary.

Data imputation and assumptions

The goal is to obtain a balance panel; therefore, a series of assumptions were made when confronted with missing values. For this, three main rules were applied:

- Imputations are based on other data from the same Member State (i.e. no estimations based on data for other Member States).
- Interpolation or the closest value over the time series of a NACE class (4-digit code) was used to impute missing values.
- When no data were available for a NACE class (4-digit code), the data for the parent NACE group (3-digit code) were evenly distributed among the classes in the group.

For the *Coastal Tourism* sector, we followed a specific approach:

The data for accommodation, transport and other expenditures cannot be separated into tourism and non-tourism activities In order to derive such estimates additional steps were required, combining the SBS data with specific statistics and surveys on tourism. For example, to calculate the number of persons employed in transport related to coastal tourism, the process applied was as follows:

- Calculate E, the expenditure on tourism transport from surveys on tourist spending.
- Calculate R, the ratio of persons employed to turnover in all transport activities (tourist and non-tourist).

The number of persons employed in tourist transport was estimated as $E \times R$.

Expenditures on tourist transport (E^{tran}) and accommodation (E^{acc}) are obtained from the Eurostat tables *tour_dem_extrw* and *tour_dem_exacw*, respectively. Expenditures on "other" categories (E^{other}), such as restaurants or purchases of goods are calculated by subtracting transport and accommodation expenditures from the total (table *tour_dem_exptot*):

$$E^{other} = E^{tot} - E^{tran} - E^{acc}$$

Data in the table *tour_dem_exp* do not include visitors from non-EU countries. To incorporate this contribution, the table *tour_occ_ninraw* is used to calculate the number of nights spent by EU residents (N_{EU}) and by visitors from all around the world (N_{world}):

$$E^i_{world} = E^i \frac{N_{world}}{N_{EU}}$$

where $i = \{acc, tran, other\}$.

Subsequently, SBS data were used to calculate the ratio R_{SBS} of the indicator I_{SBS} to turnover T_{SBS}:

$$R^i_{SBS} = \frac{I^i_{SBS}}{T^i_{SBS}}$$

For example, for persons employed in tourist transport, the ratio is calculated by dividing the total number of persons employed by the total turnover in all kinds of tourist activities (e.g., air, road, and rail). The indicator value is then estimated as:

$$I^i = \frac{E_{world}^i}{R_{SBS}^i}$$

Finally, the indicator is further adjusted to take into account the maritime proportion. This is achieved by using data in *tour_occ_ninatc* to calculate the fraction of coastal tourism (F_{coast}) as the number of nights spent in coastal areas (N_{coast}) over total nights (N_{tot}):

$$F_{coast} = \frac{N_{coast}}{N_{tot}}$$

$$I_{coast}^i = I^i \cdot F_{coast}$$

For coastal areas, we understand the municipalities with a coastline or with at least 50 % of their surface area within a distance of 10 km from the coastline. The classification of regions has been established by the TERCET Regulation: Regulation (EU) 2017/2391 of the European Parliament and of the Council of 12 December 2017 amending Regulation (EC) No 1059/2003 as regards the territorial typologies.

Breaks in the series

We have detected some breaks in some data series (e.g., the statistics on tourism for Sweden and Denmark significantly changed their methodology between 2016 and 2017). In order to avoid biases in the interpretation of the overall EU data, we have corrected those series as if the methodology would not have changed. No correction was made for other breaks as we considered that the impact of those breaks on the overall estimates for the EU or at Member States level was not material.

DATA SOURCES

The list of tables extracted from the Eurostat (and from the DCF) to make the estimations of economic indicators for the established sectors of the EU Blue Economy is summarised in Table 4.

Table 4 Main data sources for the Established Sectors of the EU Blue Economy

Table	Source	Description
DCF_fleet_aquaculture_for_BE	JRC	Fisheries and aquaculture economic statistics.
sbs_na_1a_se_r2	Eurostat	Annual detailed enterprise statistics for services (NACE Rev. 2 H-N and S95).
sbs_na_con_r2	Eurostat	Annual detailed enterprise statistics for construction (NACE Rev. 2, F).
sbs_na_dt_r2	Eurostat	Annual detailed enterprise statistics for trade (NACE Rev. G).
sbs_na_ind_r2	Eurostat	Annual detailed enterprise statistics for industry (NACE Rev. 2 B-E).
tour_dem_exacw	Eurostat	Expenditure on tourist accommodation by country / world region of destination.
tour_dem_extotw	Eurostat	Expenditure on tourism by country / world region of destination.
tour_dem_extrw	Eurostat	Expenditure on tourist transport by country / world region of destination.
tour_occ_ninatc	Eurostat	Nights spent at tourist accommodation establishments by coastal and non-coastal area.
tour_occ_ninraw	Eurostat	Nights spent at tourist accommodation establishments by country/world region of residence of the tourist.
lfsi_emp_a	Eurostat	Employment and activity by sex and age - annual data.
nama_10_gdp	Eurostat	GDP and main components (output, expenditure and income).
Prodcom (DS-066341)	Eurostat	Sold production, exports and imports by PRODCOM list (NACE Rev. 2) - annual data.

Source: Own elaboration.